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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/090,142	03/05/2002	Ikuya Miyazawa	112155	5458

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EXAMINER
EDMONDSON, LYNNE RENEE

ART UNIT	PAPER NUMBER
1725	9

DATE MAILED: 07/07/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)
	10/090,142	MIYAZAWA, IKUYA
	Examiner	Art Unit
	Lynne Edmondson	1725

-- The MAILING DATE of this communication appears on the cover she t with th correspondenc address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *05 March 2002* .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-22* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-6 and 8-22* is/are rejected.

7)☒ Claim(s) *7* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on 3/5/02 is/are: a)☑ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *5,7,8* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Priority

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file. A translation of the priority document has been received.

Double Patenting

2. Claims 12, 17, 18, 20 and 22 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 10, 14, 15, 17 and 21 of copending Application No. 10/079432. Although the conflicting claims are not identical, they are not patentably distinct from each other because both teach a soldering device comprising a flow soldering section and heater (instant claim 12) claimed as a solder supplying section which supplies molten solder (flow section) and a heater ('432 claim 10). Instant claim 17 teaches multiple heaters including an infrared heater ('432 claim 14). Instant claim 18 teaches a fan ('432 claim 15). Instant claim 20 teaches a second heater for preheating ('432 claims 10 and 17). Instant claim 22 teaches an electronic device made with the soldering device ('432 claim 21). However, the instant claims are broader than the '432 claims which teach that the preheater is at least 100 C cooler than the temperature at the time solder is supplied.

It would have been obvious to one of ordinary skill in the art at the time of the invention that the preheater would be considerably cooler than the primary heater to prevent thermal shock and warping.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 12-17 and 19-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Elliott (USPN 5232562).

Elliot teach an apparatus for soldering electronic components comprising a flow soldering section (12) and plural heaters (50, 53) in the flow soldering section with infrared preheaters (53) above and below the substrate and above and slightly downstream of the solder supply (figures 3-5 and col 5 lines 13-38 and col 6 lines 8-18). Although no solders are taught, it is understood that the solder composition does not

further limit the apparatus. The device has blowers, a chamber (col 6 lines 8-13) and a reflow section (col 5 lines 28-30). See also Elliott claims 1, 4, 15 and 24-26.

5. Claims 12-22 are rejected under 35 U.S.C. 102(b) as being anticipated by Deambrosio et al. (USPN 5230460).

Deambrosio teach an apparatus for soldering electronic components comprising a flow soldering section and plural heaters in the flow soldering section, above and below the substrate including a preheater and above and slightly downstream of the solder supply (col 3 lines 55-66, col 9 lines 1-33 and figures 18-21). At least one heater is an infrared heater (col 1 lines 20-26 and col 4 lines 54-64). Although no solders are taught, it is understood that the solder composition does not further limit the apparatus. The device has a fan, a chamber and a reflow section (col 3 lines 44-55, col 4 lines 23-30 and col 9 lines 25-33). See also Deambrosio claims 1-9.

6. Claims 1-6, 8-16 and 18-22 are rejected under 35 U.S.C. 102(e) as being anticipated by Nakatsuka et al. (US 2002/0130163 A1).

Nakatsuka teaches a soldering method for forming an electronic module (package) comprising the steps of bonding a first component (2) having Pb plated electrodes (leads) coated with Pb containing solder (paragraphs 52 and 54), flow soldering to bond to a second component through solder containing no Pb, particularly a Sn solder with Ag, Cu and/or Bi (paragraphs 48, 49, 52 and 56 Table I on page 5) and heating the joint section at the same time and after flow soldering (figure 2 and

paragraphs 46-47) by hot blast reflow (paragraph 7). A preheating step is performed before flow soldering (paragraphs 44 and 46). Soldering is performed in a chamber (unit, station) having an entrance at one end and an exit at the other (paragraphs 32, 55, 106-109 and 126-133 and figures 8 and 9). The apparatus for performing this method comprises a flow soldering section (station, unit) and a heater in the flow soldering section with a preheater (paragraphs 17-19). Although both leaded and lead free solders are taught, it is understood that the solder composition does not further limit the apparatus. One heater (22) is below the substrate (paragraph 44) and used as a preheater, the solder must be heated to keep it molten (inherent heating) with an upper heater (7) to heat the upper surface of the substrate (paragraphs 46 and 47). Heater 7 is displaced above and slightly downstream of the flow solder supply section (figure 2). The device has a fan (paragraph 82) and a chamber (unit, station) having an entrance at one end and an exit at the other (paragraphs 32, 55, 106-109 and 126-133 and figures 8 and 9). See also Nakatsuka claims 1-5, 7-14 and 16-22.

Claim Rejections - 35 USC § 103

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

8. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Nakatsuka et al. (US 2002/0130163 A1) in view of Furumoto et al. (USPN 6257480 B1).

Nakatsuka teaches a soldering method for forming an electronic module (package) comprising the steps of bonding a first component (2) having Pb plated electrodes (leads) coated with Pb containing solder (paragraphs 52 and 54), flow soldering to bond to a second component through solder containing no Pb, particularly a Sn solder with Ag, Cu and/or Bi (paragraphs 48, 49, 52 and 56 Table I on page 5) and heating the joint section at the same time and after flow soldering (figure 2 and paragraphs 46-47) by hot blast reflow (paragraph 7). A preheating step is performed before flow soldering (paragraphs 44 and 46). Soldering is performed in a chamber (unit, station) having an entrance at one end and an exit at the other (paragraphs 32, 55, 106-109 and 126-133 and figures 8 and 9). The apparatus for performing this method comprises a flow soldering section (station, unit) and a heater in the flow soldering section with a preheater (paragraphs 17-19). Although both leaded and lead free solders are taught, it is understood that the solder composition does not further limit the apparatus. One heater (22) is below the substrate (paragraph 44) and used as a preheater, the solder must be heated to keep it molten (inherent heating) with an upper heater (7) to heat the upper surface of the substrate (paragraphs 46 and 47). Heater 7 is displaced above and slightly downstream of the flow solder supply section (figure 2). The device has a fan (paragraph 82) and a chamber (unit, station) having an entrance at one end and an exit at the other (paragraphs 32, 55, 106-109 and 126-133 and figures 8 and 9). However, there is no disclosure of an infrared heater.

Furumoto teaches a soldering device with a far infrared preheater (col 9 lines 17-25) and multiple heaters for soldering in a first and second step with flow (jet) soldering (figures 1, 12 and column 3 lines 40-60).

It would have been obvious to one of ordinary skill in the art at the time of the invention to use conventional preheater such as an infrared heater as the preheater for controlled heating in a short time and thereby control temperatures on both sides of the substrate for more reliable bonding without damaging the substrate (Nakatsuka, paragraphs 63, 104, 108 and 201).

Allowable Subject Matter

9. Claim 7 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

10. The following is a statement of reasons for the indication of allowable subject matter: The closest prior art teaches the invention essentially as claimed but does not teach hand soldering in combination with flow soldering, particularly hand soldering as part of the joining process at the same time or after flow soldering. Typically one or the other is used. See Witherell et al. (USPN 4805828). When hand soldering is performed after a flow soldering process it is part of a separate repair or rework process. See Thomas et al. (USPN 4477512) and Beldavs (USPN 4573105).

Conclusion

11. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Morris (USPN 5209782, soldering device, flow, IR, reflow, plural heaters), Comerford (USPN 4600137, soldering device, flow, reflow, plural heaters, IR), Doi (JPN 09-307221-A, soldering device, flow, reflow, IR) and Watanabe et al. (USPN 6164516, soldering device, flow, reflow, plural heaters, IR, fan).

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lynne Edmondson whose telephone number is (703) 306-5699. The examiner can normally be reached on Monday through Thursday from 6:30 a.m. to 5 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7718 for regular communications and (703) 305-7115 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0651.

Lynne Edmondson
Examiner
Art Unit 1725

6/26/03

LRE
June 26, 2003